IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No.	:	**10/560603**
Applicant	:	Benninger et al.
Filing date	:	December 13, 2005
Title	:	Method and Means for Producing a Magnetically Induced Design in a Coating Containing Magnetic Particles
TC/A.U.	:	4135
Examiner	:	**Higgins**
Docket No.	:	**5777**
Customer No.	:	26936

Commissioner for Patents
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ELECTION WITH TRAVERSE

Sir:

In response to the Restriction Requirement dated July 9, Applicant hereby elects to prosecute the invention identified by the examiner as Group I, namely claims 22 - 31, without prejudice to the filing of a divisional application directed to the nonelected claims.

The Requirement is traversed for the following reasons:

In making the restriction requirement, the examiner took the position that claim 22 is not patentable over references which were considered during the international stage of the present application.

The international preliminary examination report in the present case was absolutely favorable. The counterpart European application has been allowed and grant is expected within the next few months. Under these circumstances, we must argue that the pending claims are patentable over the prior art cited in the international search report.

The principal object of the present invention is a device for transferring a customer-specific, high-resolution magnetic orientation design into a wet coating layer, said layer comprising magnetic or magnetizable particles (see page 4, Summary of the invention). This is achieved through the specific local magnetic orienting of the particles in the wet coating layer, followed by hardening the coating layer so as to fix the particles in the oriented state. While said coating composition is still wet, a specific magnetic field is applied to said coating composition.

In the process of magnetic orientation, the particles are physically rotated in the coating layer (and not only magnetized in a determined sense), which results in a local change of the optical appearance of the coating; this optical appearance change being the principle effect aimed at. Therefore, the coating composition has to be wet during said process, since otherwise the magnetic particles comprised in said coating composition could not be oriented. After orientation of the magnetic particles, the coating composition is hardened, thereby irreversibly fixing the orientation of the magnetic particles.

The general process of magnetic orientation of particles in a wet coating composition is known in the art. Using the devices of the prior art, it was, however, not possible to magnetically transfer a sharp-line design, i.e. a high-resolution pattern, into a coating layer. This is related to the fact that the particles in the coating layer align themselves with the magnetic field lines produced by the magnetic orientation device, and that magnetic field lines are generally rather smoothly varying in space.

It was surprisingly found that quite abrupt changes of the magnetic field in space (which evoke sharp-line indicia) can be produced through the engraving of the surface of a magnetized body of permanent magnetic material (see Fig. la, Fig. lb of the present application). Such abrupt changes cannot be produced through a mere juxtaposition of magnetic poles in a same plane, such as disclosed in the prior art, nor by the engraving of a magnetized, but not itself permanent magnetic material, which would need to be used in conjunction with an underlying magnet (see Fig. lc of the present application). Only the de- vice of the present invention allows to magnetically transfer sharp-line indicia into a coating layer, such as shown in Fig. 2 of the present application.

Turning now to the specific references cited in the international search report:

Document Dl (WO 02/090002) discloses the production, on a substrate, of patterned surfaces through the orientation, by an applied magnetic field, of magnetizable particles in a coating composition (p. 7, lines 18-32). Said magnetic field may be either provided by a previously applied magnetic printed image layer, or, alternatively, by an applied external magnetic source. Said source may be (p. 5, lines 23-33):

(i) a sheet magnet configured in the shape of the desired image(Figures 12, 13; page 27, lines 3-8);

(ii) a DC magnetron sputtering magnetic cathode (page 27, lines 14-20);

(iii) a magnetizable die selectively magnetized by secondary magnetic source (page 27, line 26 to page 28, line 4;

(iv) multiple magnetic poles oriented together to form an image.

The device of the present application is different from both the closest prior art devices disclosed in D1, that is:

Device i) is a sheet magnet configured in the shape of the desired image, which may have the form of the letter "F", as given in the example (Figure 13, page 26, lines

9-22); whereas the device of the present invention is an engraved, permanent-magnetic plate, which may be flat or cylindrically curved, but whose external dimensions and form are not related to the desired image; this latter being entirely contained in the engraving of the plate.

Device iii) is a magnetizable die, selectively magnetized by a secondary magnetic source, for example an iron die with the cutout or relief of an image on one surface thereof, and magnetized by an underlying permanent magnet.

The device of the present application, comprising a "body of permanent magnetic material, which is permanently magnetized in a direction substantially perpendicular to a surface of said body, characterized in that the said surface of said body carries indicia in the form of engravings, and that the said body is either a flat plate or a cylindrically curved plate", is not disclosed in D1.

Therefore D1 does not anticipate claim 22 of the present application.

D1 (US 3,676,273) discloses a method and a device to orient magnetically orientable pigment in a film forming material. In particular, the device may be a piece of sheet steel cut in a star shape and placed over a magnet or a plurality of magnets; or a steel sheet whose surface is cut, machined, etched, etc. into ridges, valleys, grooves or other relief configurations and which is placed in contact with a magnet or plurality of magnets, and the relief surface directed toward the film. Furthermore, electromagnets can be used instead of, or in conjunction with permanent magnets (col 3, line 70 to col 4, line 4).

The devices disclosed in D2 are thus made from magnetizable materials, which must be used in conjunction with at least one permanent magnet or electromagnet, such as the already dis- cussed device iii) of D1.

The device of the present application, comprising a "body of permanent magnetic material, which is permanently magnetized in a direction substantially perpendicular to a surface of said body, characterized in that the said surface of said body carries indicia in the form of engravings, causing perturbations of its magnetic field, and that the said body is either a flat plate or a cylindrically curved plate", is not disclosed in D2. Therefore, claim 22 of the present application is not anticipated by document D2.

Document D3 (EP-0 556 449 A) discloses a method and an apparatus for painting a product such as to result in a magnetically formed visual pattern in the paint containing magnetically oriented particles. The product is obtained from forming a paint layer of a paint medium comprising magnetic non-spherical particles, and applying a magnetic field having field lines in a shape corresponding to the desired pattern to be formed.

Examples of devices for transferring fine-line figure patterns into a magnetic coating are disclosed on page 10, line 58 to page 12, line 22, and Figures 11A, 11B, 12A, 12B, 13A, 133, 13C, 14A, and 143. The fine-line figure pattern to be transferred is cut out - in positive or in negative writing - from a thin plate of permanent magnetic material, which is magnetized perpendicular to the plate surface. The magnetic plate is here- by cut or punched through its entire thickness, and not only engraved. The effect of the magnetic field which develops in the free space of the holes in the plate results in magnetic patterns, which can be transferred into a wet coating comprising magnetic particles. These devices of D3 correspond more or less to device i) of D1 (see above).

However, a device comprising a "body of permanent magnetic material, which is permanently magnetized in a direction substantially perpendicular to a surface of said body, characterized in that the said surface of said body carries indicia in the form of engravings, causing perturbations of its magnetic field, and that the said body is either a flat plate or a cylindrically curved plate" is not disclosed in D3.

The other references were only identified as A documents and have clearly nothing to do with the present invention. For example, D6 (US 3,869,711) is not related at all to the orientation of magnetic particles in a coating composition. To recall briefly, according to the present invention a wet coating composition undergoes magnetic orientation of particles comprised in said coating composition. Subsequently, after orientation has been successfully carried out, the coating composition is hardened in order to fix the orientation.

In D6, nothing like that is performed. Rather, a magnetic tape is provided with a recording pattern (only magnetization and no physical rotation of particles). Said magnetic tape is not a wet coating composition, but a magnetic medium. Therefore, the method described in D6 can be compared with the method of re- cording e.g. audio signals on an old-fashioned audio cassette, where also a magnetic tape is moved over a magnetic head for purposes of recording information. This has nothing to do with the subject matter of the present invention, where magnetic indicia should be generated within a security element.

Moreover, the magnetic device used in D6 cannot be compared with the magnetic device of the present invention. To reiterate briefly, according to the present invention a permanent magnetic body is used which has a surface with engravings. As explained above, the magnetic field evoked by said body of permanent magnetic material is perturbed by said engravings in its surface.

If one now looks at the magnetic device of D6, one can see that on a body of non-magnetic material, there are provided a discrete magnetic areas (column 2, lines 47 to 52). In other words, the body of the magnetic device itself is non-magnetic. Only discrete areas on its surface are magnetic. It is immediately clear that the magnetic field evoked by said device can by no means compared with the magnetic field evoked by the magnetic body of the present invention. There is no perturbation

of magnetic field lines at the engravings, since no magnetic field is evoked by the non-magnetic body.

Moreover, there is no suggestion whatsoever that by using the device of D6 one would obtain sharper indicia in a wet coating composition than by conventional means. This is not surprising, since D6 does not relate at all to the orientation of magnetic particles within a wet coating composition. Accordingly, D6 does not provide any expectation of success to the skilled man. Given that a device having an indicia-engraved surface of a magnetized body of permanent magnetic material has not been disclosed in the prior art, and that the use of such device for the orienting of magnetic or magnetizable particles in a wet coating layer results in the unprecedented – and hence inventive – effect of transferring a sharp-line, i.e. a high-resolution pattern to the coating layer, the device of the present invention is novel and non-obvious.

In summary, we believe that common technical feature is indeed patentable, and that the restriction requirement is therefore not well founded. Furthermore, during the international phase of the present application, no objection as to lack of unity under Rule 13.2 PCT was raised.

Respectfully submitted,

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